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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Specification for Helium for Use as a Cover Gas for Liquid Sodium¹

This standard is issued under the fixed designation C 1143; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (€) indicates an editorial change since the last revision or reapproval.

€¹ NOTE—Sections 8 and 9 were renumbered and keywords were added editorially in August 1994.

1. Scope

1.1 This specification covers the requirements for helium gas to be used as a cover gas for liquid sodium. The allowable impurities in the gas are given.

2. Referenced Documents

2.1 ASTM Standards:

C 859 Terminology Relating to Nuclear Materials²

C 997 Test Methods for Chemical and Instrumental Analysis of Nuclear-Grade Sodium and Cover Gas²

2.2 NE Standards:³

NE F2-4T Quality Verification Program Requirements

NE F7-2T Preparations For Sealing; Packaging, Packing and Marking of Components for Shipment and Storage

2.3 U.S. Government Document:

Code of Federal Regulations (CFR), Title 49, Parts 178 and 179, Transportation⁴

2.4 Military Specification:

MIL-S-27626 Samples, Liquid Oxygen TTU-131/E⁵

2.5 ANSI Standards:⁶

B57.1 Compressed Gas Cylinder Valve Outlet and Inlet Connections

Z48.1 Method of Marking Portable Compressed Gas Containers to Identify the Material Contained

3. Terminology

3.1 Definitions:

3.1.1 Terms shall be defined in accordance with Terminology C 859 except for the following.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *buyer*—the organization issuing the purchase order.

3.2.2 *cover gas*—an inert gas used to blanket sodium and liquid sodium mixtures in liquid-metal-cooled reactors and related test systems.

3.2.3 *lot*—a lot shall consist of all the helium gas manufactured by the same process under the same conditions and submitted for acceptance at any one time.

3.2.4 *nominal 10 micrometer (μm) filter*—a filter that will remove 98 % of 10-μm particles and 100 % of particles larger than 25 μm.

3.2.5 *seller*—the organization supplying the gas.

4. Classification

4.1 The state of the helium will be specified in the ordering data and will be either Type I or Type II.

4.1.1 *Type I*—Compressed gases.

4.1.2 *Type II*—Cryogenic liquids.

5. Ordering and Shipping Information

5.1 *Ordering Information*—The buyer shall furnish to the seller the following information:

5.1.1 Title and number of this specification,

5.1.2 Name of buyer,

5.1.3 Delivery site,

5.1.4 Identity of cover gas,

5.1.5 Quantity of cover gas,

5.1.6 Gas or liquid state (Type I or Type II (see Section 4)),

5.1.7 Exceptions to specifications for neon, krypton, and xenon (see 6.2),

5.1.8 Procedure for cleaning and drying shipping containers,

5.1.9 Type of shipping containers, and

5.1.10 Method of shipment (see 5.2.1).

5.2 Shipping Information:

5.2.1 *Method of Shipment*—The method of shipment shall be specified in the ordering data. The seller shall comply with all federal, state, and local regulations.

5.2.2 *Shipping Containers*—Shipping containers shall be as specified in the ordering data and shall comply with Department of Transportation specifications and shall be maintained, filled, packaged, marked, labeled, and shipped to comply with current DOT regulations (CFR Title 49 (Parts 178 and 179), NE, and ANSI Z48.1). Valve connections shall comply with ANSI B57.1. Each container shall identify the type of gas

¹ This specification is under the jurisdiction of ASTM Committee C-26 on Nuclear Fuel Cycle and is the direct responsibility of Subcommittee C26.02 on Fuel and Fertile Material Specifications.

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² *Annual Book of ASTM Standards*, Vol 12.01.

³ Available from Performance Assurance Project Office, Oak Ridge National Laboratory, Bldg. 9204-1, MS-850, P.O. Box 2009, Oak Ridge, TN 37831-8050.

⁴ Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

⁵ Available from Standardization Documents, Order Desk, Building 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

⁶ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.